pression with versus without sleep difficulties was associated with lower utility scores ($b$=-0.04, $p$<0.001), greater work impairment (rate ratio=1.4, $p$<0.001), activity impairment (rate ratio=1.30, $p$<0.001), and more healthcare provider visits (rate ratio=1.31, $p$<0.001). **CONCLUSIONS:** Sleep difficulties, when combined with depression, are associated with lower quality of life and greater work productivity loss and health resource use than either sleep difficulties or depression alone, or neither. Greater attention to sleep problems in depression may lead to better outcomes.

PMH56

COMPARISON OF DIFFERENT COMORBIDITY MEASURES FOR PREDICTING PHYSICAL AND MENTAL HEALTH IN DEMENTIA

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**OBJECTIVES:** Comorbidity risk adjustment methods are increasingly used to reduce potential confounding in epidemiological research. We sought to compare the performances of four comorbidity measures in predicting physical and mental health among patients with dementia. **METHODS:** Nationally representative data from the 2000-2003 Medical Expenditure Panel Survey (MEPS) were used. The Elixhauser and the Charlson/D'Hoore, methods were based on the International Classification of Disease, 9th Revision, Clinical Modification (ICD-9-CM) codes whereas the Chronic Disease Score (CDS)-1 and the CDS-2 were based on prescription medications. The performances were compared using the $R^2$ obtained from linear regression models. The outcomes of interest were scores on the Medical Outcomes Short Form-12 (SF-12) Physical Component Scale (PCS) and Mental Component Scale (MCS). **RESULTS:** In linear regression models controlling for age and gender the CDS-2 performed the best ($R^2$= 0.242 for PCS, $R^2$= 0.157 for MCS) followed by the Elixhauser ($R^2$=0.238 for PCS; $R^2$=0.107 for MCS), the Charlson/D'Hoore ($R^2$=0.160 for PCS; $R^2$=0.038 for MCS)and the CDS-1 ($R^2$=0.154 for PCS; $R^2$=0.025 for MCS). Combining the ICD-9-CM based (Elixhauser) measure with the medication based (CDS-II) measure improved the $R^2$ for both PCS ($R^2$= 0.357) and MCS ($R^2$=0.250). **CONCLUSIONS:** We found that CDS-II comorbidity measurement method outperforms Elixhauser, Charlson/D'Hoore and CDS-I methods in predicting physical and mental health in dementia patients studied. Best performance, howver, was observed in the model that combined diagnoses based (Elixhauser) measure with the medication based (CDS-II) measure.

PMH57

ASSOCIATION BETWEEN WORK PRODUCTIVITY AND SEVERITY OF DEPRESSION AMONG FULL-TIME EMPLOYEES AS MEASURED BY THE WPAI & HPQ

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**OBJECTIVES:** This study examined the burden of depression on employees using measures of work productivity. **METHODS:** Individuals (≥18 years of age) employed full-time with diagnosed depression completed a Web-based computer-generated 25-minute survey in February 2010 (study population identified by Harris Interactive™). The survey used the Patient Health Questionnaire (PHQ-9) to assess depressive symptoms, and the Health and Work Performance Questionnaire (HPQ) and Work Productivity and Activity Impairment (WPAI) questionnaire to assess absenteeism and presenteeism. Higher scores represent more work missed on the HPQ (hours monthly) and WPAI (% time weekly) absenteeism scales. Higher scores on the HPQ presenteeism scale (measure of actual performance to possible performance, 0-100 scale), and lower scores on the WPAI presenteeism scale (% impairment past 7 days), represent better performance. Work productivity was assessed by depression severity using a trend test based on an analysis of covariance with age, gender and PHQ-9 score as independent variables. **RESULTS:** A total of 1051 full-time employees were evaluated (58% female, mean age 47 yrs). PHQ-9 scores indicated 423 (40.25%) employees with no depression symptoms, 319 (30.35%) with mild, 166 (15.79%) with moderate, 82 (7.80%) with moderately severe, and 61 (5.80%) with severe depression. All levels of depression were associated with decreased work productivity. Both the HPQ (presenteeism [81.04, 73.54, 68.61, 66.10, 61.48, no depression, mild, moderate, moderately severe, and severe depression groups, respectively], p<0.0001) and WPAI (absenteeism [0.92, 3.04, 4.55, 7.43, 14.00] and presenteeism [10.67, 26.17, 38.81, 44.68, 54.31], p<0.0001) showed progressive worsening of work productivity with increasing severity of depression. Pearson's coefficient of correlation for WPAI with PHQ-9 was 0.3158 for absenteeism and 0.6055 for presenteeism (p<0.0001). **CONCLUSIONS:** Depression has a significant impact on work productivity as measured by the WPAI and HPQ. Presenteeism and absenteeism worsened with increasing depression severity, and decreased overall productivity was seen at all levels of depression severity.

## Mental Health – Health Care Use & Policy Studies

PMH58

NEW DISEASE MANAGEMENT PROGRAM FOR OPIOID DEPENDENT PATIENTS DECREASES DRUG USE AND INCREASES 12 STEP MEETING ATTENDANCE: ONE YEAR RESULTS OF A RANDOMIZED CLINICAL TRIAL

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**OBJECTIVES:** Buprenorphine-medication assisted treatment (B-MAT) is clinically effective for opioid dependence (OD). Ancillary treatment services, however, may be needed to maximize treatment efficacy. The purpose of the present study was to investigate the one year effect of a disease management program on treatment outcomes among a national sample of OD patients. **METHODS:** Opioid dependent patients new to B-MAT (N=1.426) were randomized to receive either B-MAT plus a patient support program (intervention group, n = 987) or B-MAT alone (standard care group, n = 439). The intervention was a confidential, outbound, telephonic support program designed to provide new B-MAT patients encouragement and help them resolve problems inherent to early B-MAT treatment. Once enrolled in the study, all patients completed the Addiction Severity Index (ASI) and Treatment Services Review (TSR) at various time points over one year. The ASI is a semi structured interview designed to measure problem severity in seven functional areas known to be affected by alcohol and drug dependence. The TSR assess utilization of a variety of health, social, legal, employment, and family support services. **RESULTS:** Logistic regression analyses controlling for baseline problem severity and demographics revealed that intervention group subjects were significantly less likely to abuse opioids at month 12 ($p < .05$; exp ($\beta$) = 1.50), and were significantly more likely to attend 12 step/self-help group meetings for substance abuse ($p < .05$; exp ($\beta$) = 0.71) compared to the standard care group. **CONCLUSIONS:** Randomization to the disease management program resulted in a decrease in the reported use of opioids and an increase in self-help group counseling attendance. Supplementing B-MAT with a structured disease management program seems to be an effective way to improve patient outcomes. Current results replicate, and extend to B-MAT, findings from other studies of the effect of telephonic intervention programs on patient outcomes.

PMH59

DIFFERENCES IN BASELINE PROBLEM SEVERITY BETWEEN PRESCRIPTION AND STREET OPIOID ABUSERS AMELIORATED AFTER PARTICIPATION IN DISEASE MANAGEMENT PROGRAM: RESULTS AT ONE YEAR

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**OBJECTIVES:** Opioid dependence (OD) results from the continued abuse of opioids, which includes prescribed medication for pain (i.e., hyrodcodiene, oxycontin) and "street" opioids including heroin and methadone. Although patients receive the same OD diagnosis regardless of their opioid of abuse, prescription and "street" users represent two distinct patient populations, each with their own unique comorbidities and psychosocial profiles. The purpose of this study was to compare the effectiveness of a new disease management program (DMP) among the various types of OD patients. **METHODS:** A national sample of OD patients new to buprenorphine-medication assisted treatment (B-MAT) were enrolled in the study. The DMP was a confidential, outbound, telephonic support program designed to provide new B-MAT patients encouragement and help them resolve problems inherent to early B-MAT treatment. All patients completed the Addiction Severity Index at various time points over the course of the year. Patients were classified into prescription users (n = 303) and street users (heroin or methadone; n = 103) based on their reported opioid of abuse. **RESULTS:** Street users had significantly higher baseline legal composite scores (0.13 vs. 0.05; $p < 0.001$), while prescription users had significantly higher baseline medical (0.31 vs. 0.18; $p < 0.001$) and drug (0.27 vs. 0.25; $p < 0.05$) composite scores. Within-subjects tests revealed significant decreases on all three composite scores by month twelve. Additionally, group differences on the three composite scores were ameliorated by month twelve ($p$'s > .10). **CONCLUSIONS:** OD patients have a diverse range of medical, social, and substance abuse histories, making the design of any DMP for this population especially complicated. Although patients in this study evidenced two conflicting problem sets, results showed that the DMP worked equally in ameliorating the challenges faced by each group, indicating good generalizability of this particular DMP.

PMH60

BIPOLAR DISORDER RESULTS IN SIGNIFICANT BURDEN ON CAREGIVERS: ANALYSIS OF DATA FROM A LARGE MULTINATIONAL LONGITUDINAL STUDY (WAVE-BD)

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**OBJECTIVES:** WAVE-bd (**W**ide **A**mbispecti**VE** study of the clinical management and burden of **b**ipolar **d**isorder [BD]) is ongoing to address limitations of longitudinal BD studies to-date, few of which investigate caregiver burden. Objectives are to provide reliable, real-world data, including assessment of burden among caregivers (usually unpaid relatives or friends), an important consideration in BD patient management. **METHODS:** Multinational, multicentre, non-interventional, longitudinal study of patients diagnosed with BD with ≥1 mood event in the preceding 12 months (retrospective data collection from index mood event to enrollment, followed by a minimum 9 months' prospective follow-up). Patient selection provided a representative sample of BD populations in daily practice. Caregiver burden was assessed using the Burden Assessment Scale (BAS), where scores range 19–76, with higher scores indicating greater burden. Assessment was carried out once during any part of the prospective follow-up for one caregiver only per patient. **RESULTS:** To-date, 583/2880 patients (BD-I: 21.8%; BD-II: 16.8%) have attended their baseline appointment with their primary caregiver (caregiver mean age 50.2 years; 57% female). The majority of caregivers were patients' partners or parents (44.1% and 33.5%, respectively), with >10 years of education. The professional status of caregivers was: employed (47.4%), retired (22.7%), homemaker (16.6%), unemployed (5.8%) and other (7.4%). BAS scores were collected from 574 caregivers, and total caregiver burden was 47.6 ± 13.7 (n=424) for BD-I and 42.4 ± 12.6 (n=150) for BD-II

(p=0.0003). Burden was recorded among caregivers of patients with (at inclusion) euthymia (43.8 ± 13.1; n=329), mania (47.7 ± 13.6; n=41), hypomania (51.6 ± 12.7; n=44), depression (49.9 ± 14.4; n=137), or mixed disease status (50.2 ± 9.5; n=20). **CONCLUSIONS:** This ongoing study provides multinational perspectives on the high burden experienced by caregivers of individuals with BD-I and BD-II in everyday clinical practice settings. Study funded by AstraZeneca; Clinical Trials Registry: NCT01062607.

PMH61

NATIONAL ESTIMATES AND CHARACTERISTICS OF AMBULATORY CARE VISITS FOR DEMENTIA CARE IN THE UNITED STATES, 1998–2007

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**OBJECTIVES:** As data is limited, to determine national estimates and characteristics of Alzheimer's disease and senile dementia (AD+SD) visits in the United States (US) ambulatory setting. **METHODS:** Through a retrospective analysis of the 10-year (1998-2007) physician-office visit data of National Ambulatory Medical Care Survey, we calculated weighted national estimates and percentages of AD+SD visits made by patients aged 40 years and older with relevant ICD-9CM codes (290.xx, 294.xx, 331.xx). In multivariate logistic regression we analyzed the characteristics associated with anti-dementia drug mention at AD+SD visits. **RESULTS:** Of an estimated 6.5 million adult ambulatory care visits (5 visits per 1000 people) for AD+SD, 52%, 25%, 20%, 14%, and 11%, mentioned an antidementia (memantine, cholinesterase inhibitor, or donepezil/rivastigmine/gallantamine), anticholinergic, antidepressant, antipsychotic, and antianxiety drug respectively. Patients with AD+SD visits were predominantly 75-84 year olds (53%), white (89%), female (63%), living in metropolitan statistical area (81%), South (30%) and Northeast (28%), on Medicare (73%), seeing a freestanding private practice physician (61%) or a neurologist (32%), established patient (88%), and reported hypertension (12%). In multivariate analyses controlling for gender, type of dementia, comorbidity, and visit-year, any versus no anti-dementia drug mention was significantly less likely at visits by other versus white-race patients (adjusted odds ratio [OR] = is 0.44,95%CI: 0.42-0.46), new versus established patients (OR=0.38;95%CI:0.37–0.39), by those on self-pay versus private-insurance (OR=0.63;95%CI:0.56–0.70), and in South (OR=0.43;95%CI:0.41–0.44) and West (OR=0.41;95%CI:0.40–0.43) versus those in Northeast (all $P < 0.0001$). **CONCLUSIONS:** About 50% and 25% of AD+SD visits mentioned an anti-dementia drug and other drugs, respectively. New patients, those of other races, on self-pay and living in South or West of the US were less likely to receive an anti-dementia drug. Study findings' suggest deficiencies in access and quality of dementia care in the US warranting the attention of providers and payers and need further study.

PMH62

TREND IN UTILIZATION OF AND SPENDING ON BENZODIAZEPINES IN THE UNITED STATES MEDICAID PROGRAM: 1991-2009

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**INTRODUCTION** Although benzodiazepines are primarily considered anxiolytics, some have other indications such as seizures, insomnia, alcohol withdrawal, and tardive dyskinesia. They are also commonly abused medications, especially the brand name products, alone and in combination with other drugs (e.g. methadone). They are classified, on the basis of their half lives, into short-, intermediate- and long-acting agents. The side effects of falling and fractures cause benzodiazepines to be unattractive for elderly patients. **OBJECTIVES:** To describe trends in the utilization of, spending on, and average per-prescription spending on benzodiazepines, individually, stratified by half life, and overall, for the U.S. Medicaid programs over the past two decades. **METHODS:** A retrospective, descriptive analysis was performed using the national Medicaid pharmacy claims database, which has information on outpatient prescription claims. Quarterly prescription counts and reimbursement amounts were calculated for each of the benzodiazepines (branded or generic) reimbursed by Medicaid. Average per-prescription spending was found by dividing reimbursement by the number of prescriptions. **RESULTS:** Prescriptions for benzodiazepines among Medicaid beneficiaries increased from 6.15 million in 1991 to 16.70 million in 2009. Expenditures rose from $108.75 million to $165.79 million over the same time period, implying an average per-prescription price of approximately $10 in 2009. Whereas utilization of long-acting agents remained relatively constant at 1.79 million prescriptions per year, prescriptions for short-acting and intermediate-acting drugs rose from 1.74 million to 4.94 million, and from 2.82 million to 9.91 million, respectively. Prescriptions for flurazepam have fallen steadily from 439,106 in 1991 to 45,754 in 2009. **CONCLUSIONS:** Spending on benzodiazepines represents < 1% of Medicaid's spending on outpatient drugs. Moreover, due to generic entry for some of the drugs, the percentage rise in spending on benzodiazepines since 1991 (52.5%) was less than the general rate of inflation (57.5%). By its policy of reimbursing for generic, rather than branded, prescriptions, Medicaid reduces the opportunity for abuse.

PMH63

RISK-BENEFIT ANALYSIS OF DEPRESSION TREATMENT FOR CHILDREN AND YOUNG ADULTS

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**OBJECTIVES:** The U.S. Food and Drug Administration's decision to mandate a black-box warning on antidepressants indicating that they are associated with an increased risk of suicidal behavior in children and young adults remains controversial. We aimed to quantify the tradeoffs of alternative strategies in treating pediatric major depressive disorder (MDD) with respect to clinical benefit and risk of fatal and non-fatal suicidal behavior over a five-year time horizon. **METHODS:** We developed a disease simulation model integrating epidemiological and clinical data from the published literature in order to simulate the effect of three treatment strategies (i.e., Selective serotonin reuptake inhibitors (SSRIs), cognitive behavioral therapy (CBT), and a combination of SSRIs and CBT) on a U.S. population of children and young adults with MDD. We explored the implications of different scenarios of data extrapolation beyond the time horizon of existing data and of uncertain assumptions about suicide attempt risks and patients' response to treatment. Main outcome measures were symptom-free weeks, suicide attempts, and suicide deaths. **RESULTS:** In a cohort of 1,000,000 simulated children and young adults, there were more than twice as many suicide deaths among those started on SSRIs (1291), compared to those started on CBT (506) or combination treatment (621) over the first 36 weeks of treatment. Over a five-year time horizon, this hierarchy of suicide risk persisted, even under assumptions most favorable to SSRIs. With respect to symptom-free weeks, combination treatment was superior to both SSRIs and CBT alone, but this difference was marginal over a five-year time horizon. **CONCLUSIONS:** Considering the risk-benefit profile over a five-year period, CBT appears to offer a safer profile with respect to suicide deaths and attempts than combination treatment or SSRIs alone. While combination treatment maximizes symptom-free weeks, the additional benefit over the five-year time horizon is modest and must be weighed against the clinically meaningful increase in fatal suicides.

PMH64

COMPARISON OF THE RISPERIDONE EQUIVALENT DOSES FOR THE 9 MOST FREQUENT TYPICAL AND ATYPICAL ANTIPSYCHOTICS IN PATIENTS DIAGNOSED WITH SCHIZOPHRENIA BASED ON PRODUCT LABELS WITH ACTUAL DOSAGES PRESCRIBED IN A LARGE NATIONAL DATABASE

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**OBJECTIVES:** Physicians often make dosage decisions based on experience and heuristic factors in addition to the product label. This makes it difficult for economists to compare the "real world" costs and benefits of alternative therapeutic choices. We compare a published methodology for calculating therapeutic dose equivalence based on approved labeling for varous antipsychotics prescribed for schizophrenia with actual prescription data in that population. **METHODS:** The sample consisted of a proportional selection of patients that derived from a population of patients of all ages, across all payers, and in all regions of the United States. The information included NDC code sets, quantity, and day of supply and was aggregated from pharmaceutical prescriptions files. The frequency distribution measured the top antipsychotic medications in patients diagnosed with schizophrenia. The therapeutic dose equivalence was determined using the methodology of Woods (2003) as the comparator. **RESULTS:** A total of 324,724 patients with a diagnosis of schizophrenia were included in the study. Doses equivalent to 1 mg/day of Risperidone were 86.17 mg/day of Quetiapine, 5.09 mg/day of Olanzapine, 5.25 mg/day of Aripiprazole, 92.28 mg/day of Clozapine, and 33.74 mg/day of Ziprasidone. **CONCLUSIONS:** With the ever-increasing array of differntially-dosed medications available, it is imperative for physicians and outcomes researchers to utilize estimation of therapeutic dose equivalence that reflects actual practice patterns so that informed decisions can be made evaluating the cost and cost-effectiveness of various therapeutic choice. Our study enables pharmacoeconomic comparisons among antispychotics not only according to label-approved dosages, but also real-world dosing patterns.

PMH65

EFFECT OF PRESCRIPTION MONITORING PROGRAMS (PMP'S) ON OPIOID OVERDOSE ADMISSION

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**OBJECTIVES:** Over the past three decades the concept of prescription monitoring programs (PMPs) has developed immensely, however little evidence regarding their effectiveness has been collected. This study focuses on simple difference-in-difference evaluations, comparing the implementation effect of a PMP in Tennessee with Kentucky, which has a well-established PMP, and Missouri, which has not to-date enacted legislation to develop a PMP. The effect of interest is opioid overdose hospital admission. **METHODS:** The present study examines a simple difference-in-difference model of a natural experiment caused by the staggered implementation of prescription monitoring programs in Kentucky, Missouri, and Tennessee. We implement a pre-post design with the primary outcome of interest being hospital admission due to opioid overdose. For this evaluation we use all claims from Kentucky, Missouri, and Tennessee in the HCUP-NIS data from 2006 and 2008. The data is separated according to whether the hospital admission was due to opioid overdose. Four models are examined: main effects, individual fixed effects, and the full model, which takes into account both year and state fixed effects and shows the true effect of the Tennessee implementation. Although the findings in the Tennessee models trend positively, there are no significant findings in the full model. **RESULTS:** We look at various models, including fixed effects for state and year, but no consistently significant effect is seen. Despite no statistically significant findings, coefficients do trend in expected directions suggesting a sound model. **CONCLUSIONS:** There are multiple possible reasons for the lack of significant findings, including several study limitations. Despite the limitations, it can be said that the Controlled Substance Abuse Database Program in Tennessee has no